UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

MarkWest Houston Gas Plant
Inspection Report
Chartiers, Pennsylvania

Region III Office of Air Enforcement & Compliance Assistance
Inspection Date: April 28-30, 2015

NAICS Code: 211112

Attendees:

USEPA
Bruce Augustine, Inspector, Office of Air Enforcement & Compliance Assistance, (215) 814-2131
Chip Hosford, Inspector, Office of Air Enforcement & Compliance Assistance, (215) 814-3158
Constantinos Loukeris, EPA Region 5 Air Enforcement, (312) 353-6198

PADEP
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MarkWest
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ISS
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7/21/15
Bruce J. Augustine **Date**

7/21/15
Zelma Maldonado **Date**
Associate Director OAECA

7-21-15
Chip Hosford **Date**

BACKGROUND:

The United States Environmental Protection Agency (EPA) Region 3 conducted this inspection as part of EPA's national enforcement initiative pertaining to the oil and gas industry. This facility was previously inspected by EPA Region 3 Office of Enforcement and Compliance Assistance from November 29-December 1, 2011. The scope of the current inspection included an opening meeting, on-site Leak Detection and Repair (LDAR) monitoring, and a closing meeting.

The Pennsylvania Department of Environmental Protection (PADEP) was notified of the inspection two weeks prior to the inspection and Melissa Baggam and Cary Miller, of the PADEP, were present for the opening day of the inspection. EPA notified MarkWest of the inspection by telephone on April 27, 2015.

MarkWest is a publicly traded company (NYSE: MWE) that operates as master limited partnership (MLP) and is engaged in the gathering, processing and transportation of natural gas. The MLP was formed in January 2002 and the company headquarters is located in Denver, CO. The Houston Gas Plant was constructed and is still operated by MarkWest and is located in Chartiers Township, Pennsylvania. The facility is located in an area that is designated as attainment for NOx, SO2, and PM and marginal non-attainment for ozone.

MarkWest's primary operation at the Houston Gas Plant is to receive raw field gas from natural gas wells and separate the natural gas from the remaining constituents of the gas (ethane, butane, propane, and natural gasoline).

The Houston Gas Plant is permitted as a minor source for criteria pollutants and hazardous air pollutants. The facility currently operates under Plan Approval No. 63-00936F.

MarkWest is subject or is potentially subject to the following NESHAP standards:

- National Emission Standards for Hazardous Air Pollutants Reciprocating Internal Combustion Engines (MACT Subpart ZZZZ).
- New Source Performance Standards for Industrial-Commercial-Institutional Steam Generating Units constructed after June 19, 1984 (NSPS Db).
- New Source Performance Standards for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. (NSPS Subpart KKK).
- New Source Performance Standards for Crude Oil and Natural Gas Production, Transmission and Distribution (NSPS OOOO).
- New Source Performance Standards for Volatile Organic Liquid Storage Vessels for which Construction, Modification, or Reconstruction Occurred after July 23, 1984 (NSPS Kb).
- New Source Performance Standards for VOC Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations (NSPS NNN).
- New Source Performance Standards for VOC Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes (NSPS RRR).

April 28, 2015:

OPENING MEETING:

Bruce Augustine, Chip Hosford, and Costa Loukeris, of EPA, arrived at the facility at approximately 8:40AM on April 28, 2015. After being greeted by MarkWest personnel, Mr. Augustine indicated that EPA would be conducting a Clean Air Act inspection that involves on-site leak detection monitoring. At the start of the meeting, EPA informed MarkWest of their right to claim any material obtained during the inspection as confidential business information (CBI). MarkWest did not claim any material as CBI during the inspection. EPA informed MarkWest that the logistics of the inspection would include an opening meeting followed by three days of leak detection monitoring, and a closing meeting. Mr Augustine also indicated that during the facility walkthrough, EPA would utilize a digital camera for documentation photographs and FLIR camera to observe emission leaks. Ms. Baggam and Mr. Miller, of the PADEP, were present for the opening meeting.

The Houston Gas Plant currently consists of three natural gas fractionation plants:

	Startup	Capacity
Houston 1	April 2009	40 MMscf
Houston 2	December 2009	120 MMscf
Houston 3	May 2010	200 MMscf

Plant 4 is under construction and is anticipated to commence operation in July 2015[1]. There are two natural gas inlet pipelines in to the facility with a pressure of 910psi. H1 and H2 share an inlet line while H3 has its own inlet. There is also an inlet pipeline which carries y-grade liquids from MarkWest's gas plant in Majorsville, WV to the Houston Plant for further fractionation. All of the plants use mole sieve dehydrators to remove excess water from the gas stream.[2] In addition, all of the compressor engines are electric. The Houston Plant is currently averaging in inlet gas flow of 325-330 MMscf/day.

There two flares at the facility used to combust excess emissions from processes. The smaller flare controls emissions from H1, H2, and truck loading. This flare is air assisted. The larger flare controls emissions from H3, H4 and the de-ethanizers. The burner tips on this flare were changed approximately 1.5 years ago due to capacity issues with the existing flare burners. MarkWest indicated that the flares are equipped with flow meters, which can be used to determine the amount of material vented to the flare.

There are four storage areas scattered across the facility. Pad 1 has tanks which contain iso-butane, propane and BG mix. Pad 2 has y-grade storage tanks. Pad 3 holds butane and n-butane storage while Pad 4 has three natural gasoline storage tanks. The tanks at Pads 1-3 are

[1] MarkWest indicated that H4 will have a capacity of 200MMscf.
[2] There are no glycol dehydrators at the facility.

horizontal storage bullets that are pressurized. There is also a propane sphere, which is pressurized.

MarkWest also operates a railcar loading and unloading yard that is located approximately one mile from the Houston Gas Plant. This facility is considered part of the Houston Gas Plant for emission inventory purposes but has been exempted from permitting by the PADEP. The railcar facility is equipped with a compressor engine and a portable flare.

During the opening meeting, MarkWest personnel stated that the various process areas at the facility are subject to the following NSPS subparts:

Process Area	NSPS Subpart
Houston 1	KKK
Houston 2	KKK
Houston 3	KKK
Frac 1	OOOO
Frac 2	OOOO
De-Ethanizer	OOOO
Railcar Yard	OOOO
De-propanizer 5	OOOO
Pad 1, 2, 4	KKK
Pad 3	OOOO

MarkWest also indicated during the inspection that once Plant 4 comes online, they will monitor the entire facility for equipment leaks according to the regulations at NSPS OOOO.

MarkWest employs ISS as their third party contractor to perform leak detection monitoring at the Houston Plant. ISS has been the LDAR contractor at the facility since the plant's inception. ISS indicated that there are no areas that are specifically exempted from LDAR monitoring and that a daily leak sheet is generated after each day of monitoring. MarkWest makes all first repair attempts, while ISS develops the delay of repair report for components that can't be repaired within 15 days of a leak being detected. ISS stated that they use a TVA1000 to conduct LDAR monitoring.[3] MarkWest stated that their management of change requires them to notify ISS of any new components that are installed at the facility. ISS monitors any new components for two consecutive months before moving to a quarterly monitoring schedule. Also, if a leak is detected at a component being monitored quarterly, it returns to monthly monitoring for two consecutive months. ISS indicated that they monitor affected components according to the following schedule:

[3] The TVA1000 is the same type of device used by EPA for LDAR monitoring.

Component	Frequency
Compressors	Monthly
Valves	Quarterly
PRV's	Quarterly
Pumps	Monthly
Connectors	Annual

EPA discussed the potential applicability of several federal regulations with MarkWest. Mr. Ettore indicated that MarkWest has submitted initial notifications stating that the facility is subject to the provisions of NSPS Subparts KKK and OOOO. Mr. Ettore stated that MarkWest has not submitted notifications for NSPS NNN or RRR. EPA suggested that certain processes at the facility may be subject. MarkWest has also not submitted an initial notification for MACT ZZZZ because the emergency generators are too small.

This completed the opening meeting.

PLANT INSPECTION:

After the opening meeting, EPA commenced calibration of the two TVA1000 leak detection monitoring devices.[4] EPA commenced calibration at approximately 10:05 and LDAR monitoring began at 10:47. A summary of the leak detection monitoring conducted over the three days is included as Attachment 1 to this report and all photographs taken during the inspection are included as Attachment 2 to this report. In addition, all FLIR videos obtained during the inspection are included on a CD as Attachment 3 to this report.

Monitoring began in the inlet area for H1 and the following observations were made:

Houston 1:

- There were six new stainless steel valves observed on the H1 inlet line near component 000195 that were not identified as part of the LDAR program.
- An LDAR leak tag was observed on component 1703.1 that was leaking on 12/12/13. No recheck date was listed on the LDAR tag (See Photo 2 on Page 1 of Inspection Photos).
- Multiple LDAR tags (24) were observed on the residue line in this area.[5]

[4] Records of the calibration and serial number for these devices is kept in the calibration book for each device.
[5] A complete list of over tagged components observed on the residue line is kept in the EPA records.

- Approximately 10-15 valves that are part of the Regen SCR around V-130 were not tagged.
- Valves to the right of Tag# 001667 were not tagged. These appear to be new components.
- All bleeder valves that are part of the instrumentation assemblies (also called vent plugs) are not tagged as part of the LDAR program (see Photo 4 on Page 2 of Inspection Photos).
- There were approximately 6 insulated valves that were observed with no access to the valve to effectively conduct Method 21 monitoring.

LDAR monitoring ceased in H1 at 12:05 and a break was taken. After lunch monitoring reconvened in Frac1 (de-propanizer 4) at 12:42.

Frac1:

- Two valves to the left of 004368 have no tags and three valves above tag 004353 are not tagged. Six additional unmarked valves were observed in Frac 1.
- One open ended line at 004348 was observed and was leaking with a concentration of 600ppm. This leak was confirmed by ISS with a reading of 1428ppm
- All bleeder valves that are part of the instrumentation assemblies (also called vent plugs) are not tagged as part of the LDAR program for the facility (See Photo 4 on Page 2 of the Inspection Photos).

Depropanizer 5

- The connectors on the fin fans in Frac 1 and De-propanizer 5 are not included in the LDAR program. The connectors at the end of the assembly are in contact with process material. The valves and other connectors on the fin fans are included in the LDAR program (See Photo 12 on Page 6 of the Inspection Photos).
- Two valves observed with no tag between V432 and tag 008743
- Two open ended lines observed on 008676 and 008736

This ended the first day of the inspection.

April 29, 2015:

EPA arrived at the facility for the second day of the inspection at 0840. A brief opening meeting was held to discuss the logistics for the day. EPA expressed to MarkWest that the

connectors on the fin fans may need to be included as part of the LDAR program. MarkWest indicated again that the facility is transitioning to NSPS OOOO when Houston 4 comes online later in 2015. An initial notification will be required that reflects that the entire facility is subject to NSPS OOOO. ISS stated that they are using FEMS as their leak detection database software but are switching over to guideware. EPA calibrated the TVA devices and commenced monitoring in the De-ethanizer.

De-ethanizer

- The Mariner East Pipeline[6] runs adjacent to the facility and there is a tie-in on MarkWest property. There are no LDAR tags on this line.
- There are sporadic tags in the propane refrigeration building with some lines being tagged partially while the remainder of the line isn't tagged.
- EPA observed several hundred LDAR tags on lines downstream of the De-ethanizers which should not be included in the LDAR system.
- At least five valves were observed on insulated lines with no access port for LDAR monitoring.
- There were no LDAR tags on any equipment located in Storage Pad 3. There are nine bullet tanks in this area.

Truck Loading

- There were three valves west of tag 006160 with no tags.
- Tag 003573 was equipped with a LDAR leak tag on 04/16/15. There is no recheck information listed on the LDAR leak tag.
- There are missing tags after component 006436. It appeared during the inspection that only the condensate lines have been tagged and not the gas/vapor lines in this area.
- There were five valves observed on the y-grade pipe as it comes out of the ground with no LDAR tags.
- Multiple open ended lines were observed in the truck loading area, including 006189, 006172, 006227, 003587, 003532, 003594, 003650, 003523, 003470.

Frac 2

- There appears to be new equipment just after 005524 with no LDAR tags.
- There is a new control valve located between 005775 and 005778 with no LDAR tags. According to the tag on the equipment this valve was calibrated on 09/29/14.
- A new valve between 005779 and 005780 is not tagged for LDAR.

[6] This pipeline is owned by Sunoco

- An open ended line at 005575A was observed. It was leaking at 1800ppm while the ISS reading on the OEL was 1560ppm.

This ended day 2 of the inspection.

April 30, 2015:

During the third day of the inspection, another brief opening meeting was held to discuss logistics. Mike Conner provided an overview of the Farris pilot operated pressure relief valves that were observed leaking in the plant. Mike indicated that the bottom vent on the assembly is the one that could potentially leak because the O-rings fail which relieves pressure on the internal spring. Mike also provided some manufacturers data on the valves. The TVA devices were calibrated and monitoring commenced in the railroad loading rack area at approximately 0930.

Railroad Loading Rack

- Two open ended lines were observed at 011015 and 010981.
- There were untagged components observed on both loading stations 1 & 2 west.

After the railroad loading rack, EPA conducted additional monitoring in the Frac 2 area.

CLOSING MEETING:

Following the conclusion LDAR monitoring a closing meeting was held with MarkWest at approximately 1600 on 04/30/15. EPA confirmed the additional information that MarkWest would provide after the inspection and some of the data that was obtained during the inspection (i.e., the LDAR database from ISS). ISS indicated that the database provided was up to date through 04/28/15. EPA also requested additional information regarding the operation of the two flares on-site. MarkWest agreed to provide the design specifications for the new burners. Also, they stated that they would review the design specifications on the process safety valves that were leaking during the inspection. I indicated that EPA would review the information provided and an inspection report would be provided to MarkWest and the PADEP.

THE FOLLOWING DOCUMENTS WERE OBTAINED DURING THE INSPECTION:

- A copy of an access database containing all LDAR monitoring data through 04/28/15
- Copy of pilot operated pressure relief valve specifications from Farris Engineering.
- Houston Gas Plant PHA Inventory
- List of Storage Tanks including Tank ID, Maximum Capacity, In service Date dated 02/12/15

- Copies of Houston 1 Orifice Calibration Test Report for Inlet, Bypass, and Outlet dated 04/14/15
- Houston 4 potential to emit
- Houston 4 emission calculations
- Houston Facility Plot Plan (CBI)

MarkWest provided the following additional information post-inspection via email:

- 05/05/15 email from Dave Ettore providing ISS LDAR leak values for specific valves requested by EPA.
- 05/11/15 email from Dave Ettore providing the number of components tagged in Storage Pad 3.
- 05/13/15 email from Dave Ettore providing addition ISS LDAR leaking valve readings.
- 05/15/15 email from Dave Ettore providing John Zink flare manual for new flare burners (CBI)

RECORD REVIEW:

EPA is still reviewing the LDAR database provided by MarkWest and ISS during the inspection. A review of the 2nd half 2014 LDAR reports for NSPS KKK and OOOO revealed that MarkWest is monitoring a leak rate of <1% in the same process units monitored during the inspection by EPA. LDAR monitoring conducted by EPA in the process units included in Attachment 1 demonstrate leak rates at much higher rates >5%. Further questions regarding the data may be forwarded to MarkWest.

AREAS OF CONCERN:

The following bullets have been identified as *potential* issues identified during the inspection. They are issues that require either further investigation by EPA or explanation by MarkWest. Any additional information concerning these areas provided by MarkWest would provide useful in determining the extent of any future actions by EPA.

1. They were numerous LDAR tags identified in the De-ethanizer and on residue gas lines for components that should not be included in the monitoring program. These components should not be in VOC service >10% and are not required to be monitored by MarkWest. MarkWest should provide an explanation as to why these components are included in the system and how they will identify and remove erroneously tagged components.

2. There were several areas identified in the facility were incomplete tagging/identifying of components in the LDAR program was apparent. For example, there were missing tags on the Mariner East propane line, sections in truck loading, new components in Houston 1, Frac 2, and De-Propanizer 5. The MOC program at Houston may be inadequate to address the Additon/deletion of components from the LDAR system and should be reviewed.

3. Several insulated valves were identified throughout the facility where there was no access port to properly conduct Method 21 monitoring.

4. There were several open ended lines identified throughout the facility that were not double blocked. These were documented in almost every process unit.

5. Based on the number of valves monitored and the corresponding leak rates determined by EPA, MarkWest may not be properly implementing Method 21 at the Houston Facility. Method 21 monitoring is required under NSPS KKK and OOOO.

6. There were no LDAR tags and all of the components in the Storage Pad 3 (Nine n-butane storage tanks) were not included in the LDAR program. Mark West commenced identifying and tagging this are while the inspection was ongoing. After the inspection MarkWest stated that 281 valves, 660 connectors, and 18 process safety valves were tagged in this area.

7. MarkWest has not included any of the connectors from the fin fans in De-propanizer 3, 4, and 5 and the De-ethanizer in their LDAR program. These components are in contact with process liquids and are potentially subject to Method 21 monitoring.

8. There are several process areas at the facility that were subject to NSPS KKK where new components were added or changes were made that made them subject to NSPS OOOO. Either new construction was added to these areas or a new upstream process area sends NSPS OOOO affected process material into an NSPS KKK affected components. For example, the truck loading area was constructed prior to the NSPS OOOO affected construction date, however, material from the natural gasoline tanks subject to NSPS OOOO is sent through the loading racks making them NSPS OOOO affected. MarkWest has not converted at least these areas to NSPS OOOO:

    - Truck loading (n-butane, natural gasoline racks)
    - Y-grade storage tanks that receive product from the De-ethanizer
    - De-propanizer 2 and 3 located within H2 and H3
    - Surge tank at the bottom of the De-methanizer in H2 and H3.

    MarkWest should provide the construction date for each process unit at the facility and provide an update on the NSPS KKK and NSPS OOOO status of the facility.

9. MarkWest has failed to capture and control all emissions from process safety valves that are designed with a pilot assist mechanism. Anywhere from 2-15% of pilot can vent process gas without triggering the PSV to vent to the flare header. MarkWest is not accounting for the excess emissions.

10. MarkWest has failed to include all components such as bleeder valves on instrumentation and other valves due to gaps in the MOC process.

11. While inspecting the railcar loading racks, EPA noticed that several of the loading

rack arms were missing LDAR tags and that there were numerous leaks were the arms attach directly to the cars. These emissions occur during loading of railcars and are not captured and controlled. Emissions from railcar loading may be under reported to PADEP.

12. The Houston Facility is potentially subject to NSPS NNN and RRR. MarkWest stated during the inspection that the facility has not submitted any initial notifications or completed any measures to comply with these regulations. EPA continues to investigate the applicability of these regulations to the facility.

13. Due to the number of untagged components discovered at the facility, MarkWest may be underestimating their annual emissions of VOC and HAP and under reporting these emissions to the PADEP. The addition of new untagged components into the LDAR program along with inaccurate component counts could result in the facility potentially becoming a major source of VOC emissions and require a Title V permit. This facility has not submitted a Title V permit application to the PADEP as of the date of this inspection report. Since the facility is located in the ozone transport region, they would be subject to LAER emission controls for VOC.

Attachment 1

MarkWest Houston Gas Plant EPA LDAR Monitoring Summary

28-Apr-15

Process Unit	No. Valves Monitored	No. Pumps Monitored	Leak Summary		
			Tag Id	EPA Reading	ISS Reading
Houston 1	198	1	1644	1405	2600
			1646	560	675
			1628	681	630
			1692	690	750
			1691	880	585
			1301	524	N/A
			1270	6300	N/A
			1300	3000	N/A
			1323	890	N/A
			1338	>10000	N/A
			1566	2800	N/A
			1505	3300	N/A
			1525	800	N/A
			1526	550	N/A
			1519	680	N/A
			1484	1200	N/A
			1466	800	N/A
			1387	2000	N/A
			CV next to 1549	950	N/A
			1537	860	N/A
Frac 1	116	1	4455	13000	N/A
			4470	780	N/A
			4511	660	N/A
			4508	2200	N/A
			4340	810	N/A
			4436	790	1100
			4354	680	867
			4407	780	1500
			4435	1480	961
			4439	15300	52000
			4401	840	1530
			4400	560	513
De-Propanizer #5	128	0	8686	866	794
			8719	3300	4600
			8729	1400	DOR
			8533	10000	18500
			8535	1600	1400
			8661	520	N/A

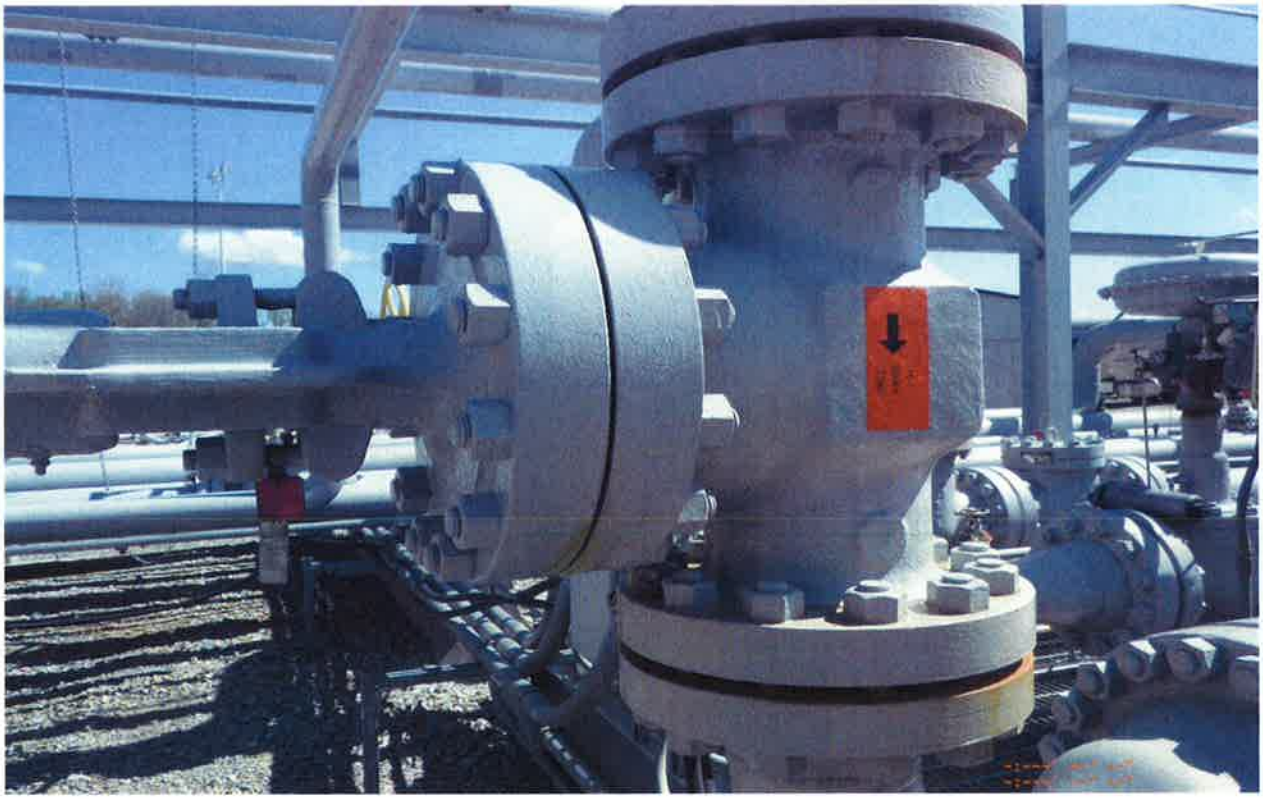
29-Apr-15

De-Ethanizer	211	0	9408	600	N/A
			9079	>10000	N/A
			9039	800	N/A

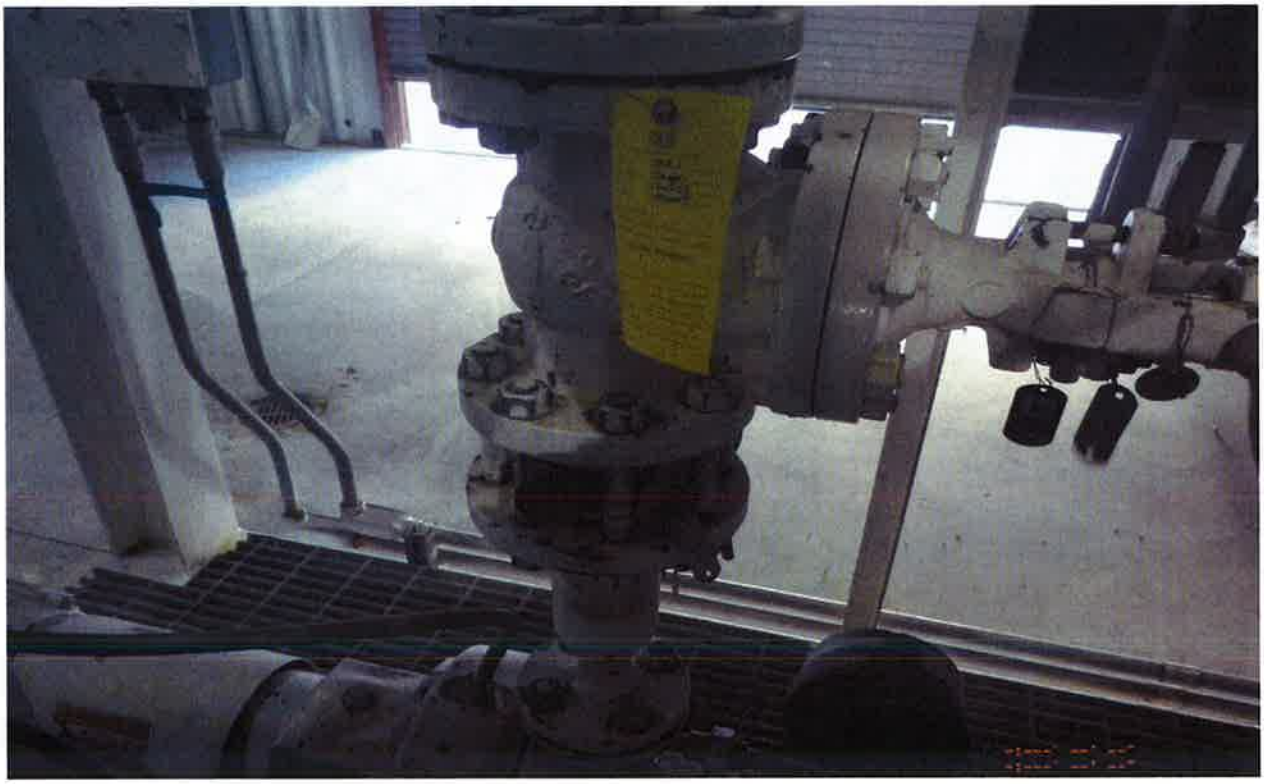
			9025	600	N/A
			9019	1000	N/A
			8891	600	N/A
			8890	600	N/A
			8972	6800	10800
			8967PSV	50000	>10000
			8935	4000	6453 tagged
			8950	9000	8965
			8952	1500	11800
Propane Rack off of Sphere	10	0			
			1st Plug at TK-601	600	N/A
Storage Pad #3	18	0	inlet		
Truck Loading	99	0	6219	10000	214000
			6142	800	1000
			6150	1100	2000
			3587	10000 OEL	N/A
			3532	1000 OEL	N/A
			3594	3500 OEL	N/A
			3650	>10000	N/A
			3523	3000 OEL	N/A
			3470	>10000 OEL	N/A
Frac 2	60	0	5589	680	660
			5601 PSV	3800	2800
			5617	3500	N/A
30-Apr-15					
RRLR	249	0	7568	1200	2200
			7588CN	1800	2200
			7607	780	1171
			11018	1890	1430
			11012	6500	9100
			10972	789	830
			10867	1400	1050
			10881	980	980
			10811	2000	12000
			Valve after 7691 No valve 7692 or 7693	>15000	N/A
			7789	3000	N/A
			7867CN	800	N/A
			7323	580	600
			7620	608	645
			7621	880	1513
			7866.02	800	N/A
			7557	600	N/A
			7552	2100	N/A

			7553	1000	N/A
			7554	3700	N/A
			7536	20000	N/A
			7531	1200	N/A
			7521	7500	N/A
			7502	570	N/A
			7503	670	N/A
			10529	10100	N/A
			10542	5400	N/A
			10544	600	N/A
			10634	2000	N/A
			10633	1500	N/A
			10723	1000	N/A
			7914.2	4000	N/A
			7914.3	1900	N/A
			7920.01	1800	N/A
			7927.01	1000	N/A
			7872.02	750	N/A
Frac 2	70	0	5987	10500	8800
			5682PSV	2400	2500
			5683PSV	4400	7000
			5713	580	N/A
			5715	1100	N/A
			5701	590	N/A

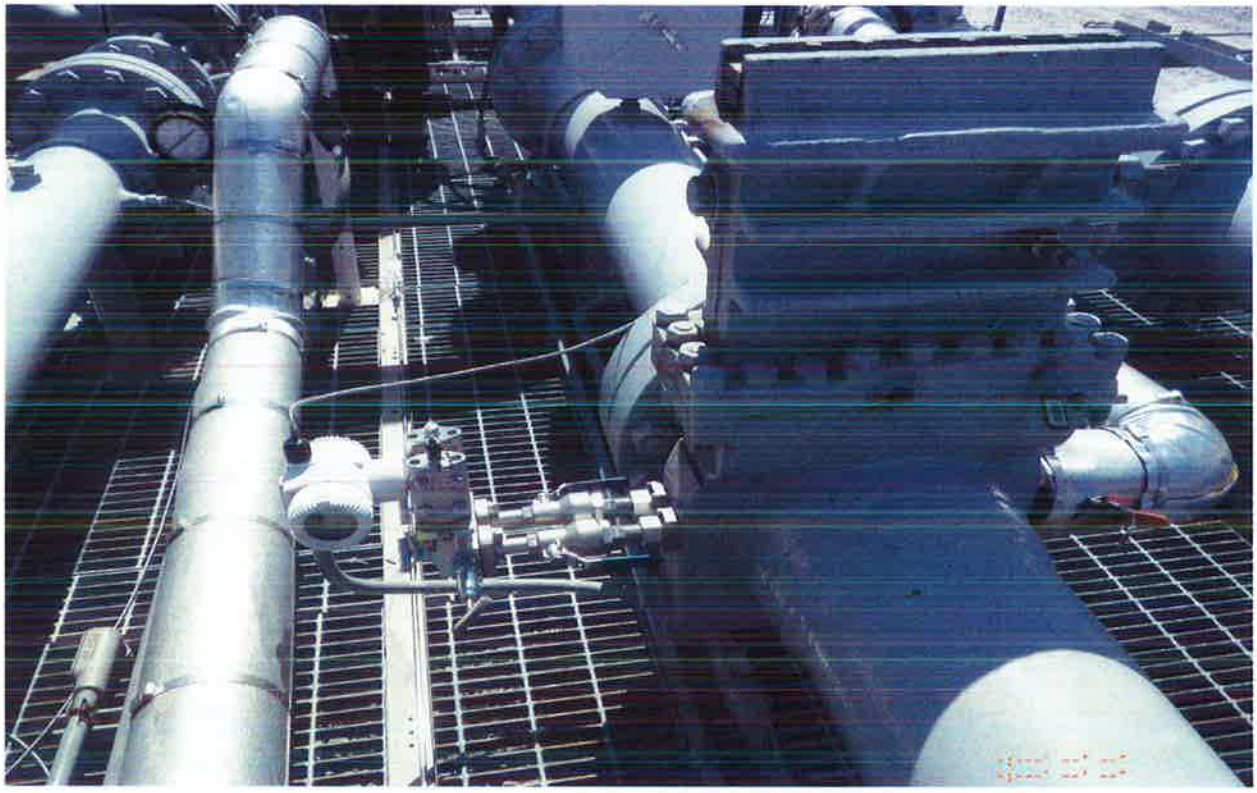
Attachment 2



1. Houston 1 Residue Gas Line w/LDAR Tag 000240 – MarkWest Houston – 04/28/2015

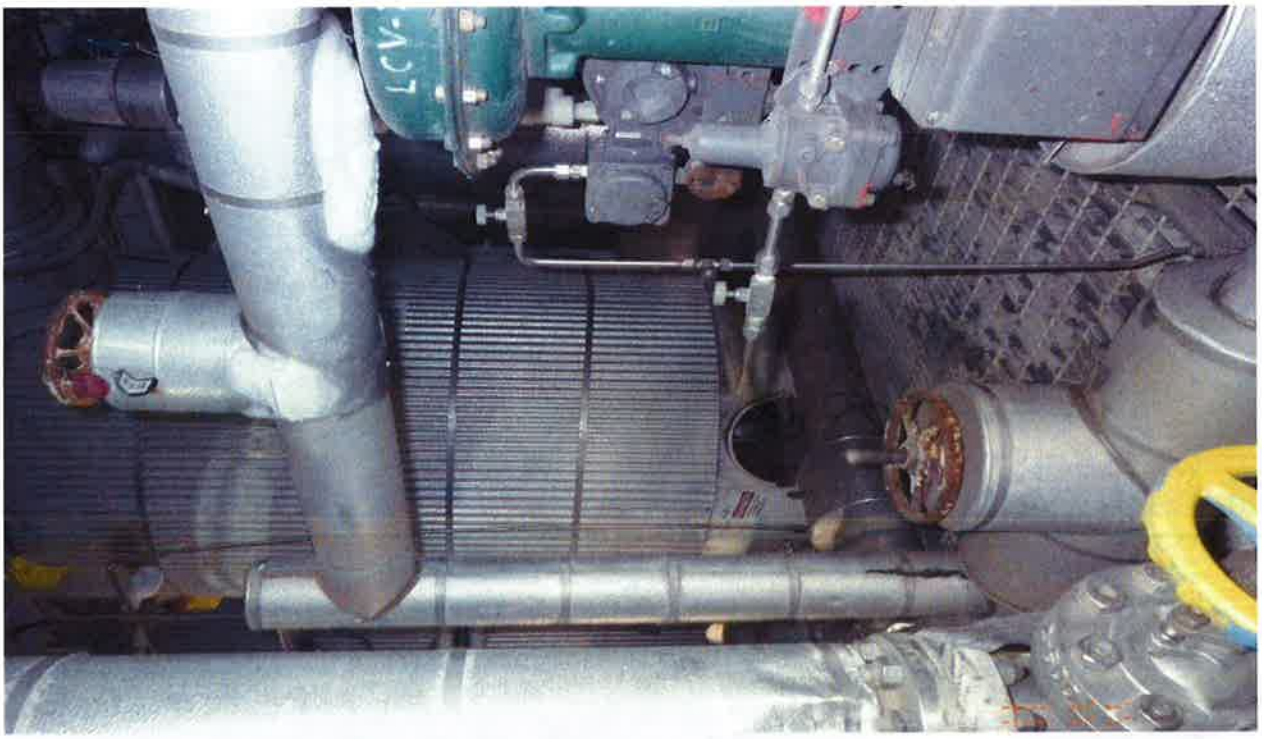


2. ISS Leak Tag on Flange 001703 – MarkWest Houston – 04/28/2015

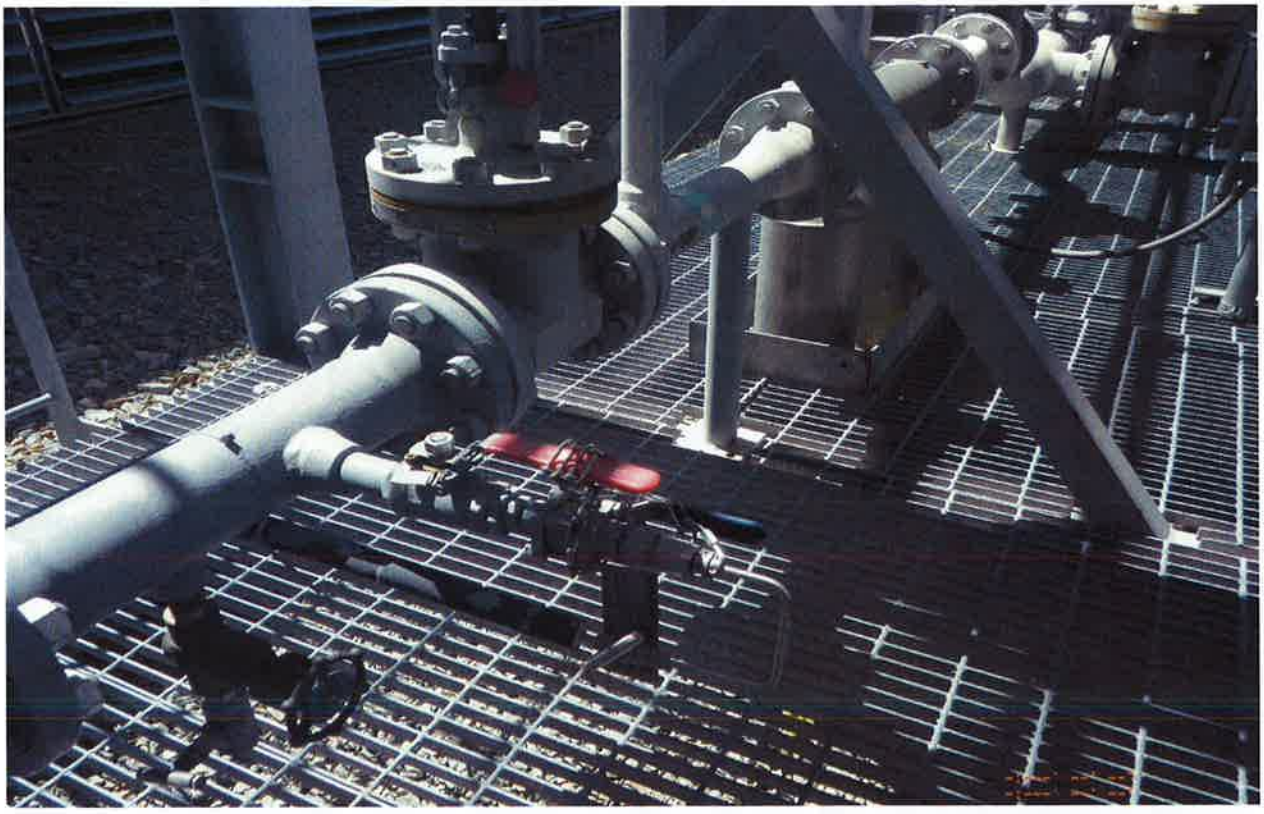


3. New untagged components on Houston 1 Inlet Gas Line – MarkWest Houston – 04/28/2015

4. Bleeder Valve next to 001656 not tagged for LDAR – MarkWest Houston – 04/28/2015

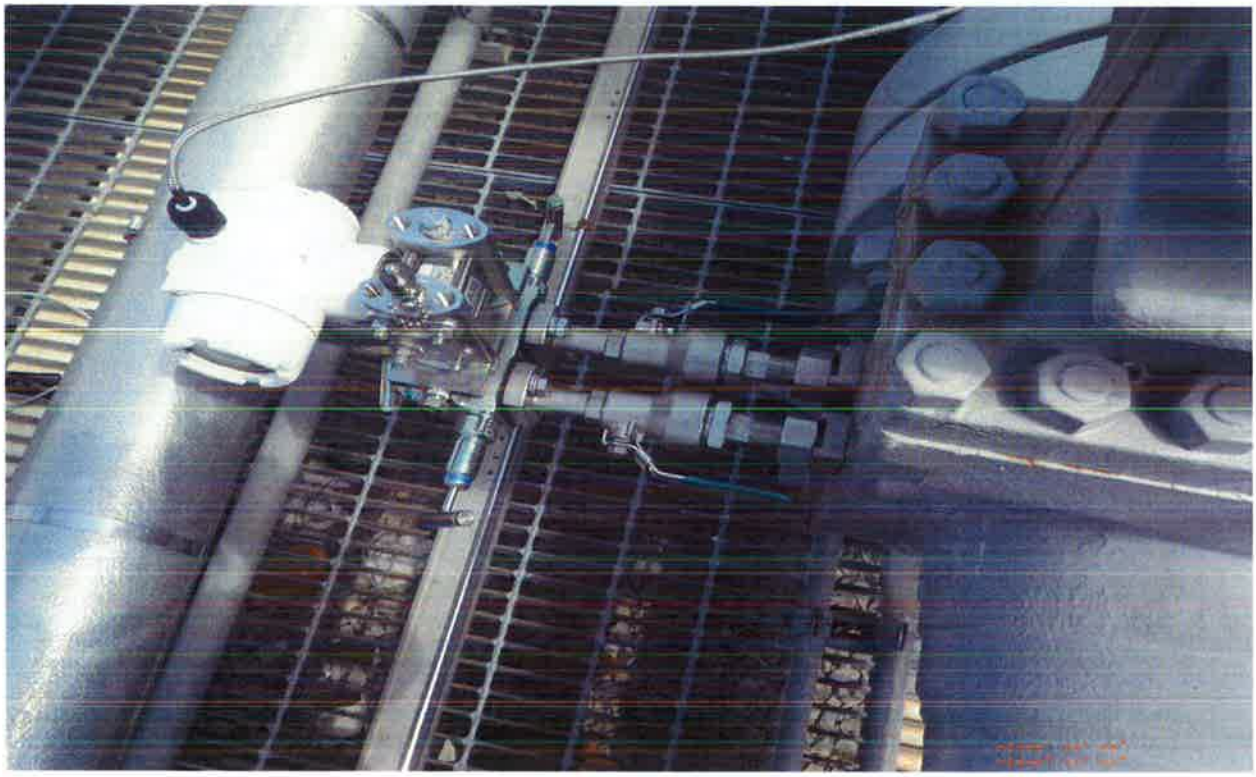


5. Insulated valves 001476 and 001475 in Houston 1 – MarkWest Houston – 04/28/2015



6. Untagged valves at De-propanizer 4 – MarkWest Houston – 04/28/2015

7. Closer view of untagged valves at De-propanizer 4 skid – MarkWest Houston – 04/28/2015



8. Seven untagged valves near 000194 in Houston 1 Inlet – MarkWest Houston – 04/28/2015

9. Seven untagged valves in Houston 1 Inlet – MarkWest Houston – 04/28/2015

10. Leaking Pressure Relief Valve – MarkWest Houston – 04/28/2015

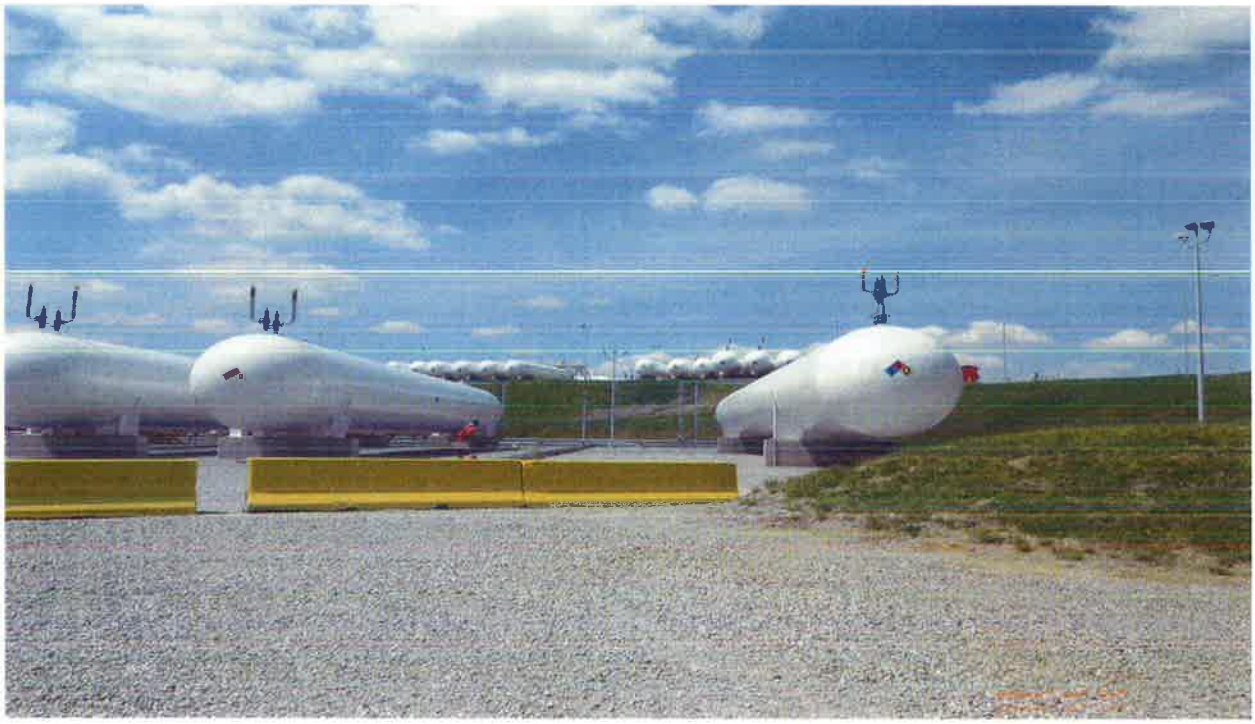
11. Second Photo of Leaking Farris PRV – MarkWest Houston – 04/28/2015

12. Connectors on Fin Fan De-Propanizer 5 Not Tagged for LDAR – MarkWest Houston – 04/28/2015

13. MarkWest Houston Plant – MarkWest Houston – 04/29/2015

14. Mariner East Propane Pipeline Untagged for LDAR – MarkWest Houston – 04/29/2015

15. Pad 3 N-Butane Storage Bullets – MarkWest Houston – 04/29/2015

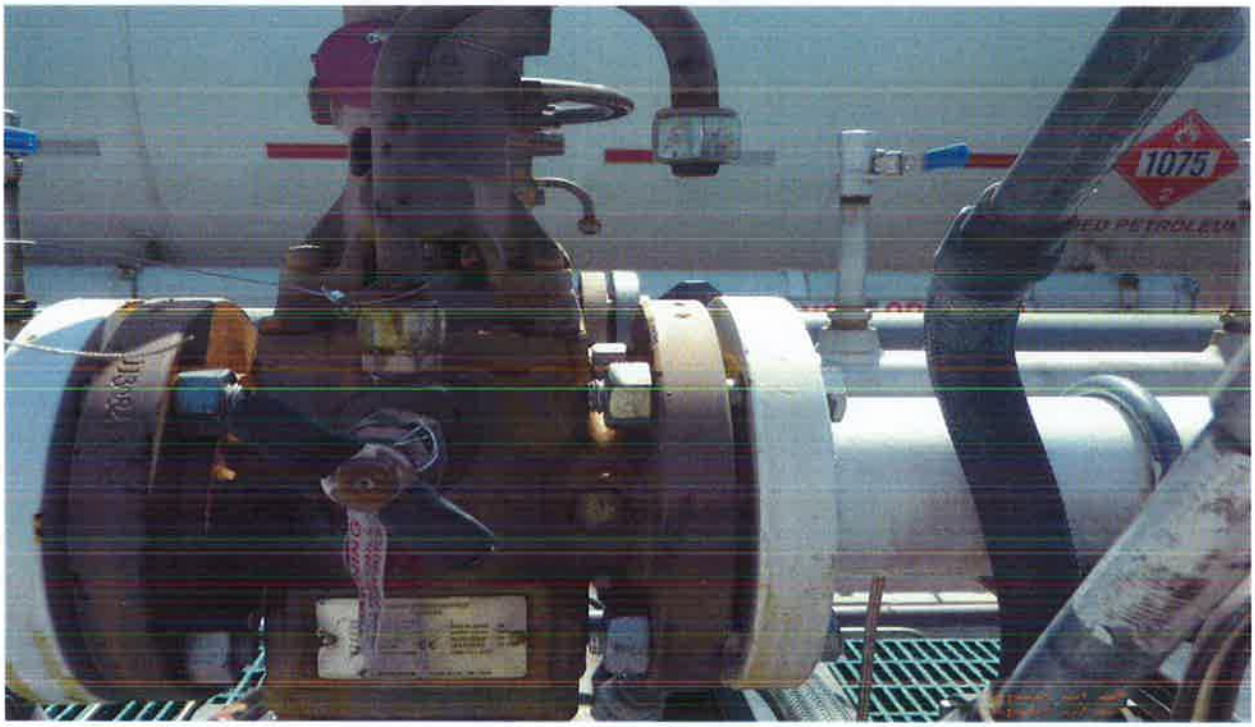


16. Second View of N-Butane Storage Tanks – MarkWest Houston – 04/29/2015

17. Sampling Line from N-Butane Storage Tank – MarkWest Houston – 04/29/2015

18. N-Butane Storage Tank – MarkWest Houston – 04/29/2015

19. N-Butane Storage Area Untagged for LDAR – MarkWest Houston – 04/29/2015



20. Open Ended Line in N-Butane Storage Area – MarkWest Houston – 04/29/2015

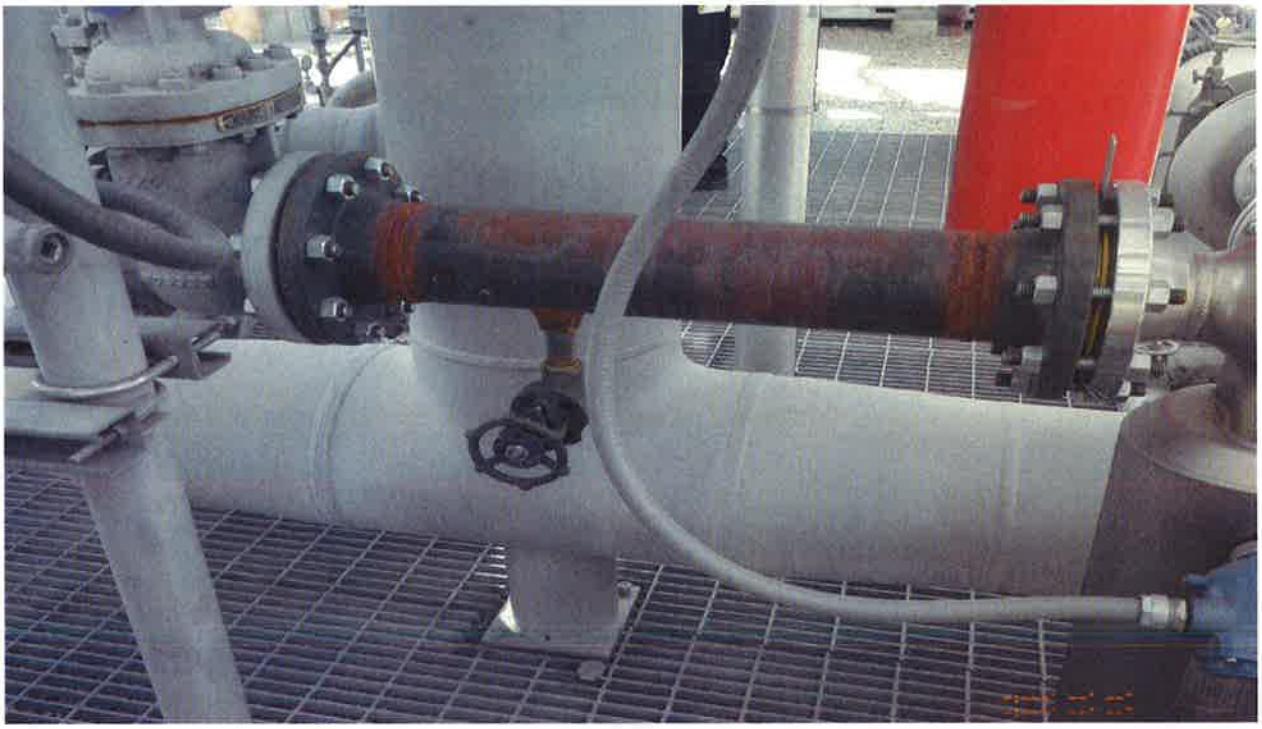
21. Closed Drain Tank – MarkWest Houston – 04/29/2015

22. Four Missing Tags after 005524 - MarkWest Houston – 04/29/2015

23. Process Safety Valve Open to Atmosphere – MarkWest Houston – 04/29/2015

24. Second View of PSV Open to Atmosphere – MarkWest Houston – 04/29/2015

25. New Control Valve between 005775 & 005778 No Tags – MarkWest Houston – 04/29/2015

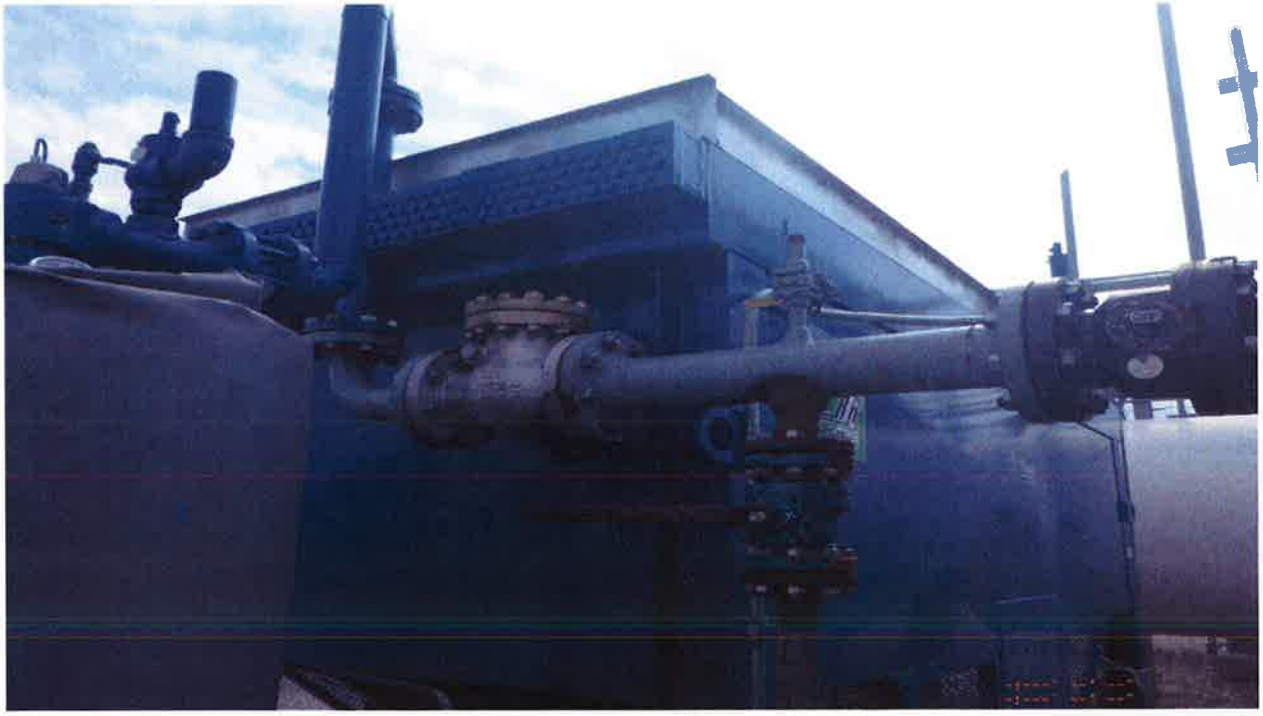


26. New Piping between 005779 & 005780 with NO LDAR Tags – MarkWest Houston – 04/29/2015

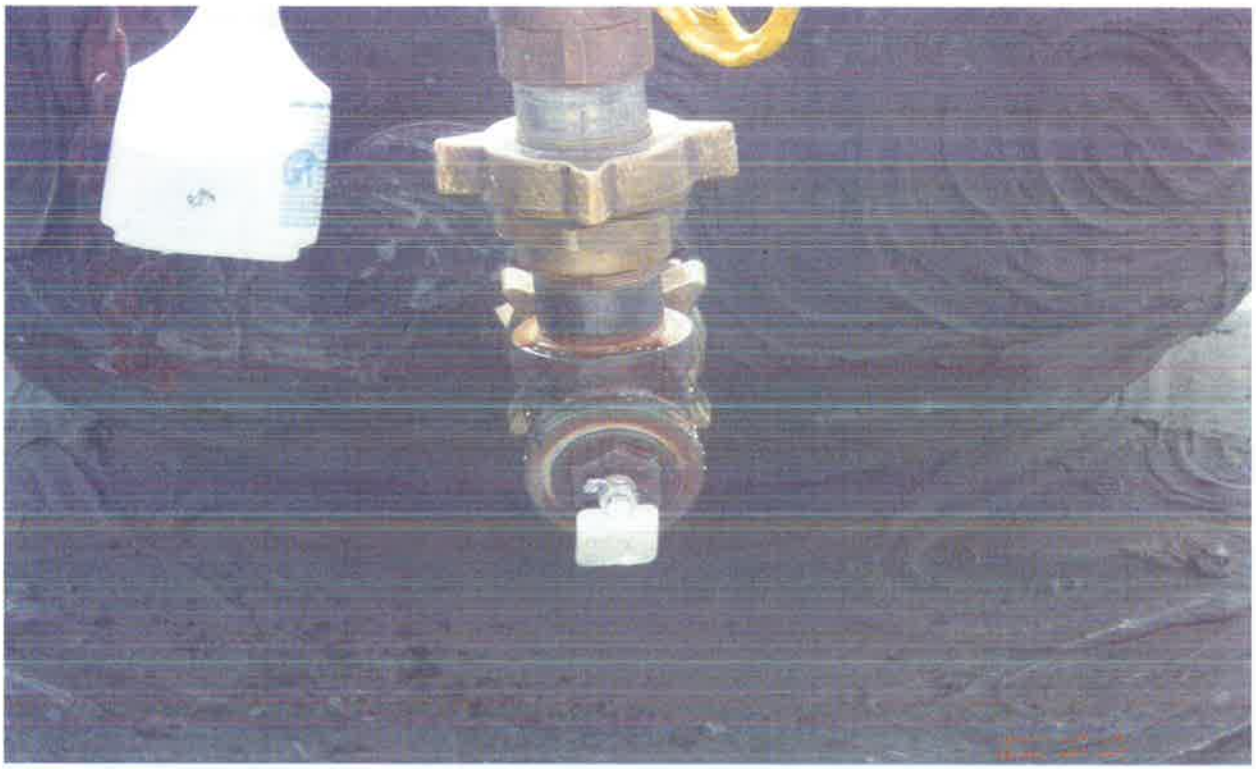
27. Temporary Flare Venting Railcar – MarkWest Houston – 04/30/2015

28. Flare at Railroad Loading Area – MarkWest Houston – 04/20/2015

29. Kingsly Compressor with Plugs at End of Unit – MarkWest Houston – 04/30/2015



30. Second View of Plugs on Kingsly Compressor – MarkWest Houston – 04/30/2015



31. Bleeder Valve 010811 on Railcar Loading Station (Leaking) – MarkWest Houston – 04/30/2015

Attachment 3